Pesticide Clearinghouse Summary for the Nebraska Department of Agriculture
Progress Report for the period October 1, 2013 to September 30, 2014

This summary of activities associated with the Nebraska Ground Water Pesticide Clearinghouse is submitted in fulfillment of a cooperative agreement between the Nebraska Department of Agriculture and the Board of Regents of the University of Nebraska.

**The Database**

The database currently contains 354,277 pesticide analyses for 5,370 wells. This is a 1.3% increase (approximately 4,500 results) in the quantity of pesticide data since the last progress report. Data added in the last year include additional 2012 results and 2013 results from the Lower Platte South Natural Resources District, 2012 results from the Nebraska Department of Environmental Quality, 2013 results for Papio-Missouri River Natural Resources District contributed by the USGS and 2013 results from the Lower Platte North Natural Resources District. The 2012 data included this year required additional data verification and could not be added last year with the other 2012 data. The pesticide database is complete and up-to-date with respect to all agency submissions. To date, 240 pesticides and pesticide degradates have been measured in Nebraska ground water. No new pesticides or pesticide degradates were added to the database in the last year. Table 1 contains the complete list of analytes.

The pesticide data added this year had a small effect on the distribution of the data by well use (Figure 1). Monitoring well data continue to constitute the majority (62%) of the database and approximately 64% of those data are from the MSEA study. Irrigation (12%), domestic (17%), and public supply (8%) well data largely comprise the remainder of the analyses. Stock and industrial well data do not contribute significantly to the database.

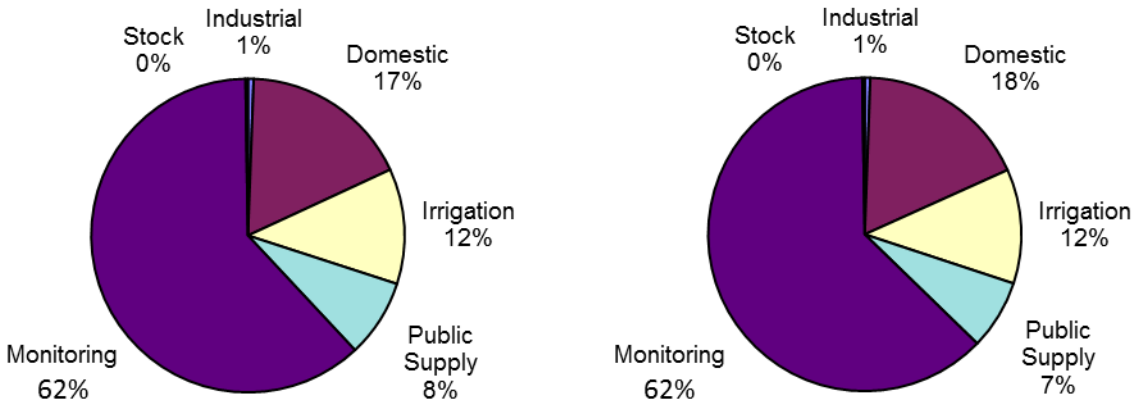


Figure 1. Distribution of the data by well use as of September 30, 2014 (a) and September 30, 2013 (b).

Figure 2 shows the relative contribution of each agency to the pesticide database. The Natural Resources Districts' contribution increased due to the addition of a substantial amount of data from 2012 and 2013.

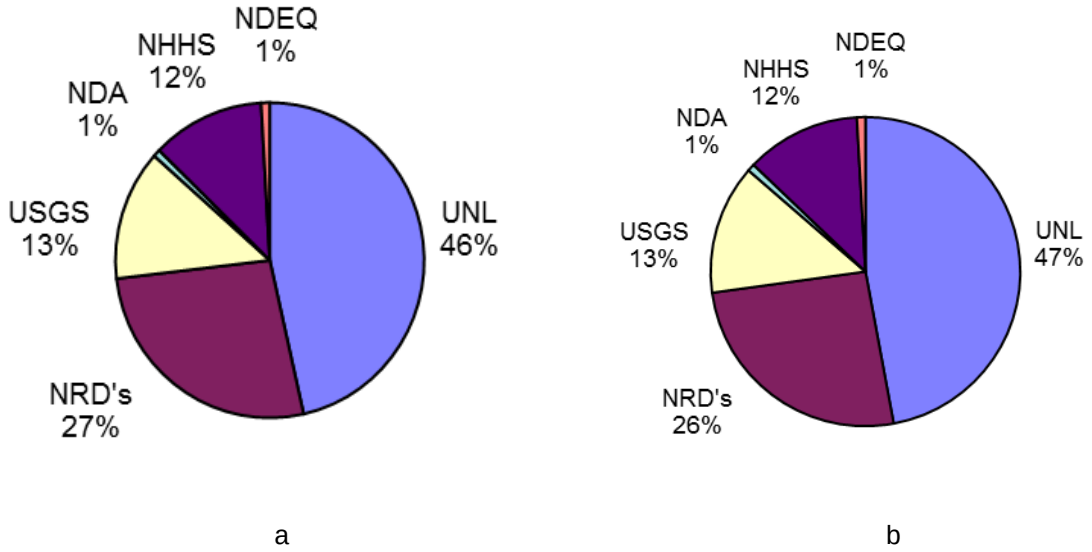


Figure 2. Sources of the pesticide data as of September 30, 2014 (a) and September 30, 2013 (b).

Since 1976, 53 pesticides and pesticide degradates have been detected at least once (Table 1). During the present decade (2004-2013), 29 pesticides and degradates have had at least one detection.

Atrazine remains the most frequently detected pesticide in Nebraska ground water. Figure 3 shows the distribution of the 1671 wells sampled for atrazine in the 10-year period from 2004-2013 and the relative concentrations. While atrazine was detected during this 10 year period in 5.3% of the wells, none of the concentrations exceeded the 3 μg/L maximum contaminant level (MCL). During the same period, the atrazine degradates deethylatrazine (DEA) and deisopropylatrazine (DIA) were detected in 2.5% and 0.7%, respectively, of the wells in which they were measured. Alachlor and metolachlor were detected in 0.06% and 1.6% of the wells, respectively. Alachlor, a regulated pesticide, did not exceed the MCL.

During the two five-year periods from 2004-2008 and 2009-2013, the incidence of atrazine detection- was 5.5% for both periods and the incidence of DEA detections decreased from 3.8% to 1.1%. The detections of DIA increased from 0.5% to 1.4% during the same five-year periods. Metolachlor detections also increased from 0.7% to 2.8%. While alachlor was detected at an incidence of 0.1% in the five years from 2004-2008, there were no detections in the 691 samples analyzed in the last five years. Overall, there was a decrease in the number of ground water samples analyzed for each of these analytes during the five-year period from 2009-2013 relative to the preceding five-year period.

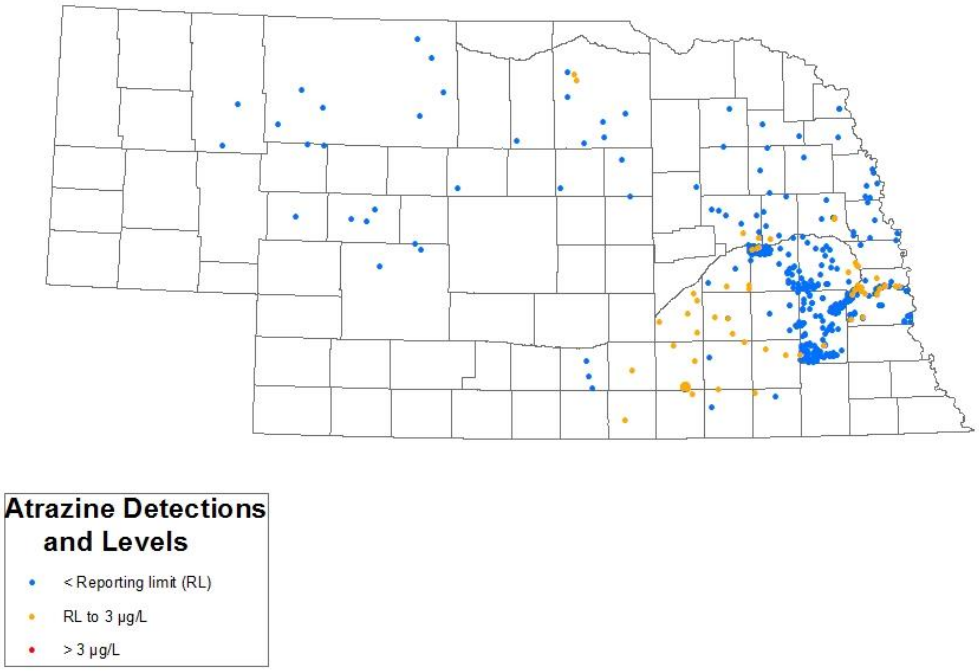


Figure 3. Locations and levels of atrazine in wells sampled 2004-2013.

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The pesticide data added in the last year had quality assessment flags of 2, 3, 4, and 5. There are significant differences in the proportions of data associated with each quality flag during the two 5-year periods (figure 4). The primary factors affecting quality flags are the type of well sampled, whether or not the screen interval is known, and if a sufficient number of field duplicates were collected.

**Summary of 2013 Activities**

The 2013 pesticide data were acquired from the Lower Platte South, Lower Platte North, and Papio-Missouri River NRDs. The Papio-Missouri River NRD data were collected and submitted by the USGS. Data for 2012 were acquired from the Lower Platte South NRD and the Nebraska Department of Environmental Quality. All data were reviewed, assessed and incorporated into the database. These data will be uploaded to the website in November, 2014.

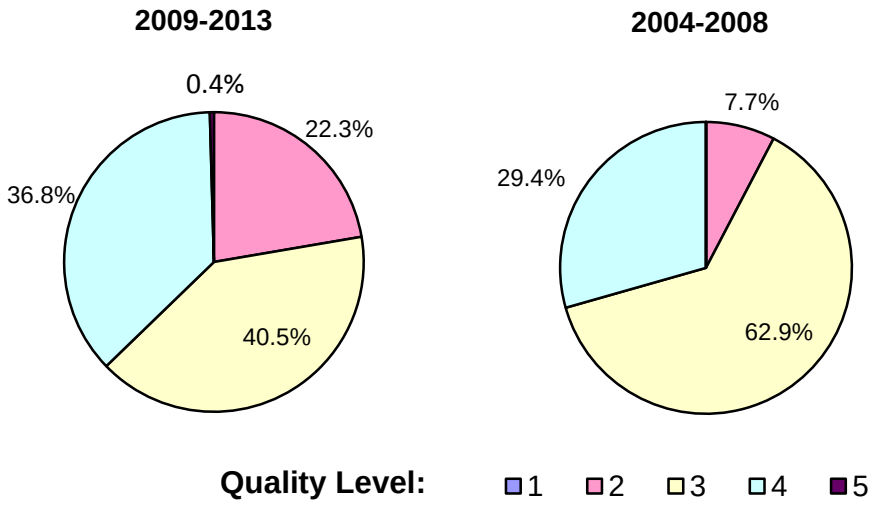


Figure 4. Percentage of analyte data for each quality assessment flag for the periods 2009-2013 and 2004-2008.

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**Future Activities**

The focus for the coming year will be the acquisition, assessment, and incorporation of 2014 NRD data into the database. Updates for the on-line version of the database will be submitted to the Nebraska Department of Natural Resources (NDNR) by November 1, 2015. The September 2015 off-line update will include all available data through 2014 to ensure that the NDEQ and the NDA year-end reports are based on the latest and most complete dataset available. Public water supply wells are omitted from the on-line version of the database for security reasons. We will work with the NDNR and the NDA to upload the ELISA data for 2010-2014 to the clearinghouse website link developed for ELISA.

Table 1. Pesticide analytes and the number of wells in which the analyte was measured from 1976-2013. Analytes not analyzed in the last 10 years are highlighted in gray. Those not analyzed in the last 20 years are highlighted in gray and outlined with a box.

| Pesticide | Number of Wells | Pesticide | Number of Wells |
|---|---|---|---|
| 1,1,1-trichloroethane | 33 | aldicarb sulfone | 236 |
| 1,2,4-trichlorobenzene | 33 | aldicarb sulfoxide | 223 |
| 1,2-dibromo-3-chloropropane | 199 | aldrin* | 340 |
| 1,2-dibromoethane | 356 | alpha-HCH | 451 |
| 1,2-dichlorobenzene | 33 | ametryn* | 791 |
| 1,2-dichloroethane*+ | 199 | atrazine*+ | 4890 |
| 1,2-dichloropropane* | 199 | azinphos-methyl | 328 |
| 1,3-dichloropropane | 166 | azinphos-methyl oxon | 34 |
| 1,4-dichlorobenzene | 199 | bendiocarb | 197 |
| 1-naphthol | 77 | benfluralin | 645 |
| 2,4,5-T | 67 | benomyl | 197 |
| 2,4,6-trichlorophenol | 10 | bensulfuron-methyl | 197 |
| 2,4-D | 285 | bentazon | 222 |
| 2,4-D methyl ester* | 197 | benzo(a)pyrene | 56 |
| 2,4-DB | 223 | beta-HCH | 162 |
| 2,4-dinitrophenol | 10 | bromacil*+ | 575 |
| 2,6-diethylaniline | 328 | bromomethane | 199 |
| 2-[(2-ethyl-6-methylphenyl)-amino]-1-propanol | 20 | bromoxynil | 223 |
| 2-[(2-ethyl-6-methylphenyl)amino]-2-oxoethane sulfonic acid*+ | 65 | butachlor | 619 |
| 2-chloro-2',6'-diethylacetanilide | 39 | butylate* | 3965 |
| 2-ethyl-6-methylaniline | 42 | carbaryl | 2617 |
| 3,4-dichloroaniline | 38 | carbofuran | 2610 |
| 3,5-dichloroaniline | 7 | carbon disulfide | 166 |
| 3-hydroxycarbofuran | 223 | carbon tetrachloride* | 190 |
| 4,6-dinitro-o-cresol | 26 | carboxin | 124 |
| 4-chloro-2-methylphenol | 34 | chloramben methyl ester | 197 |
| 4-chloro-3-methylphenol | 10 | chlordane | 297 |
| 4-nitrophenol | 10 | chlorimuron-ethyl | 197 |
| acenaphthene | 10 | chloroform* | 31 |
| acetochlor*+ | 1775 | chlorothalonil | 26 |
| acetochlor ethane sulfonic acid*+ | 108 | chlorpyrifos* | 3144 |
| acetochlor oxanilic acid*+ | 108 | chlorpyrifos oxon | 34 |
| acetochlor sulfynilacetic acid | 69 | cis-1,3-dichloropropene | 166 |
| Acifluorfen | 223 | cis-permethrin | 327 |
| Acrylonitrile | 195 | clopyralid | 223 |
| alachlor*+ | 4626 | cyanazine* | 4623 |
| alachlor ethane sulfonic acid, secondary amide*+ | 69 | cyanazine acid*+ | 12 |
| alachlor ethane sulfonic acid*+ | 557 | cyanazine amide | 16 |
| alachlor oxanilic acid*+ | 557 | cycloate | 322 |
| alachlor sulfynilacetic acid | 69 | cyfluthrin | 34 |
| aldicarb | 206 | cypermethrin | 34 |
| | | cyprazine | 71 |

*Detected in at least one sample.
+Detected in the last 10 yrs.

Table 1. (continued)

| Pesticide | Number of Wells | Pesticide | Number of Wells |
|---|---|---|---|
| DCPA | 338 | endrin | 423 |
| DCPA monoacid | 233 | endrin aldehyde | 162 |
| DDD | 180 | EPTC* | 1935 |
| DDT | 180 | esfenvalerate | 18 |
| dechloroacetochlor | 9 | ethalfluralin | 645 |
| dechloroalachlor | 9 | ethion | 40 |
| dechlorodimethenamid | 9 | ethion monoxon | 34 |
| dechlorometolachlor*+ | 9 | ethoprop | 289 |
| deethylatrazine*+ | 2147 | ethyl parathion | 2553 |
| deethylcyanazine | 12 | fenamiphos | 39 |
| deethylcyanazine acid*+ | 12 | fenamiphos sulfone | 39 |
| deethylcyanazine amide | 12 | fenamiphos sulfoxide | 31 |
| deethylhydroxyatrazine | 12 | fenuron | 223 |
| deisopropylatrazine*+ | 1991 | fipronil | 191 |
| deisopropylhydroxyatrazine | 12 | fipronil sulfide | 191 |
| delta-HCH | 162 | fipronil sulfone | 191 |
| demethylfluometuron | 12 | flufenacet | 75 |
| desulfinylfipronil | 191 | flufenacet ethane sulfonic acid | 108 |
| desulfinylfipronil amide | 191 | flufenacet oxanilic acid | 108 |
| di(2-ethylhexyl)adipate | 56 | flumetsulam | 196 |
| di(2-ethylhexyl)phthalate*+ | 56 | fluometuron | 235 |
| diazinon* | 487 | fonofos*+ | 3952 |
| diazoxon | 38 | fonofos oxon | 34 |
| dicamba | 263 | heptachlor*+ | 340 |
| dichlobenil | 26 | heptachlor epoxide*+ | 339 |
| dichlorprop | 223 | hexachlorobenzene | 187 |
| dichlorvos | 34 | hexachlorocyclopentadiene | 187 |
| dicrotophos | 32 | hexazinone | 401 |
| didealkylatrazine*+ | 30 | hydroxyacetochlor | 9 |
| dieldrin | 719 | hydroxyalachlor*+ | 9 |
| dimethenamid | 443 | hydroxyatrazine* | 209 |
| dimethenamid ethane sulfonic | 108 | hydroxydimethenamid | 9 |
| dimethenamid oxalic acid | 108 | hydroxymetolachlor | 9 |
| dimethoate | 46 | hydroxysimazine*+ | 12 |
| dinoseb | 223 | imazaquin | 167 |
| diphenamid | 322 | imazethapyr | 195 |
| disulfoton | 437 | imidacloprid | 197 |
| disulfoton sulfone | 7 | iodomethane | 166 |
| diuron* | 451 | iprodione | 34 |
| endosulfan I | 169 | isofenphos | 333 |
| endosulfan II | 162 | isoxaflutole | 696 |
| endosulfan sulfate | 169 | | |

*Detected in at least one sample.
+Detected in the last 10 yrs.

Table 1. (continued)

| Pesticide | Number of Wells |
|---|---|
| isoxaflutole benzoic acid*+ | 696 |
| isoxaflutole diketonitrile*+ | 696 |
| lindane | 712 |
| linuron | 302 |
| malathion | 366 |
| malathion oxon | 39 |
| MCPA | 223 |
| MCPB | 223 |
| metalaxyl | 224 |
| methidathion | 39 |
| methiocarb | 236 |
| methomyl | 236 |
| methoxychlor | 423 |
| methyl paraoxon | 34 |
| methyl parathion* | 2500 |
| methylene chloride | 33 |
| metolachlor*+ | 4444 |
| metolachlor ethane sulfonic acid*+ | 557 |
| metolachlor oxanilic acid*+ | 557 |
| metribuzin* | 4516 |
| metsulfuron-methyl | 167 |
| molinate | 289 |
| myclobutanil | 39 |
| naphthalene | 33 |
| napropamide | 289 |
| neburon | 223 |
| nicosulfuron | 197 |
| norflurazon | 223 |
| oryzalin | 221 |
| oxadiazon | 58 |
| oxamyl | 223 |
| oxyfluorfen | 7 |
| p,p'-DDE (previously DDE) | 469 |
| pebulate | 289 |
| pendimethalin* | 1668 |
| pentachlorophenol | 10 |
| permethrin* | 976 |
| phorate | 782 |
| phorate oxon | 34 |
| phosmet | 34 |
| phosmet oxon | 29 |
| picloram* | 223 |
| prometon* | 2345 |
| prometryn* | 792 |
| propachlor* | 2342 |
| propachlor ethane sulfonic acid | 69 |
| propachlor oxanilic acid | 69 |
| propanil | 289 |
| propargite | 289 |
| propazine* | 2044 |
| propham | 236 |
| propiconazole | 197 |
| propoxur | 236 |
| propyzamide | 328 |
| siduron | 197 |
| silvex | 66 |
| simazine*+ | 2510 |
| simetryn | 219 |
| sulfometuron-methyl | 197 |
| tebuthiuron* | 329 |
| terbacil | 415 |
| terbufos | 3740 |
| terbufos oxon sulfone | 39 |
| terbuthylazine | 57 |
| terbutryn | 93 |
| tetrachloroethene | 33 |
| thiobencarb | 289 |
| toxaphene | 246 |
| trans-1,3-dichloropropene | 166 |
| triallate | 607 |
| trichloroethene | 33 |
| triclopyr | 223 |
| trifluralin* | 4359 |
| vernolate | 125 |

*Detected in at least one sample.
+Detected in the last 10 yrs.